What is claimed is:

1. A differential interference optical system comprising:

an illumination source;

a first polarizing element for converting a ray of light emitted from said illumination source into linearly polarized light;

a first polarizing member for separating said linearly polarized light converted by said first polarizing element into two linearly polarized components which vibrate perpendicular to each other and travel at a slight separation angle;

a lens system for illuminating and observing an object to be observed;

a second polarizing member for combining said two linearly polarized components on an identical path after passing through said lens system; and

a second polarizing element for converting a ray of light combined by said second polarizing member into linearly polarized light,

wherein at least one polarizing member of said first polarizing member and said second polarizing member possesses a position of localized fringes at which said two linearly polarized components intersect with each other, and a distance from said at least one polarizing member to said position of localized fringes is variable.

2. A differential interference optical system according to claim 1, wherein an angle made by a normal of a surface of said at least one polarizing member with an optical axis of said differential interference optical system is changed and thereby said distance from said at least one polarizing member to said position of localized fringes can be changed.

3. A differential interference optical system according to claim 1, wherein each of

said first polarizing member and said second polarizing member includes a combined body having two wedge-shaped prisms cemented to each other so that at least one polarizing member of said first polarizing member and said second polarizing member is rotated 180° around a rotary axis lying in a plane including an optical axis and a normal of an interface between said two wedge-shaped prisms, and thereby a distance from said at least one polarizing member to a position of localized fringes can be changed.

4. A differential interference optical system according to claim 1, wherein each of said first polarizing member and said second polarizing member includes a combined body having two wedge-shaped prisms cemented to each other so that at least one of said first polarizing member and said second polarizing member can be switched to one of a plurality of third polarizing members including combined bodies, each having two wedge-shaped prisms cemented to each other, and a switched polarizing member of said third polarizing members is rotated 180° around a rotary axis lying in a plane including an optical axis and a normal of an interface between said two wedge-shaped prisms and thereby a distance from said switched polarizing member to said position of localized fringes can be changed.

5. A differential interference optical system according to claim 2, wherein an angle made by said normal of said surface of said at least one polarizing member with said optical axis of said differential interference optical system is changed, and said at least one polarizing member is moved in a direction perpendicular to said optical axis of said differential interference optical system.

6. A differential interference optical system according to claim 2, wherein said first polarizing member or said second polarizing member is a Wollaston prism or a Nomar-

ski prism.

7. A differential interference optical system according to claim 6, wherein one of said Wollaston prism and said Nomarski prism is constructed to satisfy the following condition:

$$|\Delta\theta| \times d < 12$$

where d is a thickness of said prism, in millimeters, and $\Delta\theta$ is a variation of an angle made by a normal of a surface of said prism with said optical axis of said differential interference optical system, in degrees.

8. A differential interference optical system according to claim 1, wherein one of said first polarizing member and said second polarizing member includes only a first birefringent element with a property of birefringence, separating an incident ray of light into two linearly polarized components vibrating perpendicular to each other and traveling at a slight separation angle, or a combination of said first birefringent element with a second birefringent element which separates an incident ray of light into two linearly polarized components vibrating perpendicular to each other so that said two linearly polarized components emerge in parallel therefrom.

9. A differential interference optical system according to claim 8, wherein said second birefringent element has at least one plane-parallel birefringent member.

10. A differential interference optical system according to claim 8, wherein said first polarizing member or said second polarizing member is a Wollaston prism or a Nomarski prism.

11. A differential interference optical system according to claim 1, wherein said lens system for illuminating and observing an object to be observed includes an illumination lens system for illuminating said object and an objective lens system for observing said object.

12. A differential interference optical system according to claim 1, wherein a separation of an incident ray of light into two linearly polarized components vibrating perpendicular to each other and traveling at a slight separation angle and a combination of said two linearly polarized components on an identical path are achieved by one polarizing member.

13. A differential interference optical system comprising:

an illumination source;

a first polarizing element for converting a ray of light from said illumination source into linearly polarized light;

at least one polarizing member for separating an incident linearly polarized light into two linearly polarized components vibrating perpendicular to each other and traveling at a slight separation angle;

a lens system for illuminating and observing an object to be observed; and

a second polarizing element for converting incident rays of light into linearly polarized light,

wherein said at least one polarizing member possesses a position of localized fringes at which said two linearly polarized components intersect with each other, and a distance from said at least one polarizing member to the position of localized fringes is variable.

14. A differential interference optical system according to claim 2, wherein said at least one polarizing member includes a plurality of polarizing members, and said plurality of polarizing members are different in angle made by a normal of a surface of said at least one polarizing member with an optical axis of said differential interference optical system.

15. A differential interference optical system according to claim 2, wherein said at least one polarizing member is turned, with a center of rotation at a position where a phase difference between said two linearly polarized components caused by said at least one polarizing becomes zero.

16. A differential interference optical system according to claim 2, wherein said at least one polarizing member is turned, with a center of rotation at a point where a normal of a surface of said at least one polarizing member is inclined at a predetermined angle with respect to an optical axis of said differential interference optical system and said at least one polarizing member itself is moved in a direction perpendicular to the optical axis of said differential interference optical system.

17. A differential interference optical system according to claim 2, wherein said at least one polarizing member is turned, with a center of rotation at a point lying on an optical axis of said differential interference optical system, other than a point where an interface between two wedges of said at least one polarizing member intersects with the optical axis of said differential interference optical system.

18. A differential interference optical system according to claim 14, wherein wedge members constituting each of said plurality of polarizing members have identical shapes

and angles.

19. A differential interference optical system comprising:

a light source;

a first linearly polarizing element;

ray separating means for reflecting or transmitting a ray of light;

a birefringent member;

an observing optical system; and

a second linearly polarizing element,

said birefringent member being rotated 180° around a rotary axis which lies in a plane including an optical axis and a normal of an interface of said birefringent member.

20. A differential interference optical system according to claim 3 or 19, wherein said rotary axis is positioned to be parallel to a surface of said member and to lie on a center line of, or separate from, said member.

21. A differential interference optical system according to claim 3 or 19, wherein said rotary axis is positioned to satisfy the following condition:

$$|\Delta\theta| \times d < 12$$

where d is a thickness of said member, in millimeters, and $\Delta\theta$ is an angle made by a normal of a surface of said member with said rotary axis, in degrees.

22. A differential interference optical system according to claim 3, wherein an angle made by a normal of a surface of said at least one polarizing member with an optical axis of said differential interference optical system can be changed.

23. A differential interference optical system according to any one of claims 3 or 19-22, wherein said first polarizing member or said second polarizing member is a Wollaston prism or a Nomarski prism.

24. A differential interference optical system according to claim 1, wherein each of said first polarizing member and said second polarizing member includes a combined body having two wedge-shaped prisms cemented to each other so that at least one polarizing member of said first polarizing member and said second polarizing member is previously rotated 180° around a rotary axis lying in a plane including an optical axis and a normal of an interface between said two wedge-shaped prisms, and thereby a distance from said at least one polarizing member to a position of localized fringes can be changed.

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